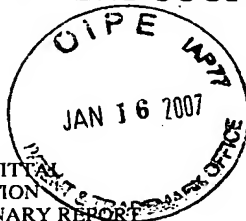


10/591114  
**PCT**

From the INTERNATIONAL BUREAU

Wittenberg

NOTIFICATION OF TRANSMITTAL  
OF COPIES OF TRANSLATION  
OF THE INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY  
(CHAPTER I OR CHAPTER II  
OF THE PATENT COOPERATION TREATY)  
(PCT Rules 44bis.3(c) and 72.2)

To:

**IAP15 Rec'd PCT/PTO 16 JAN 2007**

REITSTÖTTER, KINZEBACH & PARTNER (GBR)  
Ludwigsplatz 4, Patentanwälte  
67059 Ludwigshafen, Kinzebach & Part.  
ALLEMAGNE

Ing. 15. Nov. 2006

Ludwigsplatz 4, D-67059 Ludwigshafen

Date of mailing (day/month/year) 09 November 2006 (09.11.2006)	<b>IMPORTANT NOTIFICATION</b>
Applicant's or agent's file reference M/44239-PCT	
International application No. PCT/EP2005/002253	International filing date (day/month/year) 03 March 2005 (03.03.2005)
Applicant BASF AKTIENGESELLSCHAFT et al	

## 1. Transmittal of the translation to the applicant.



The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter I).



The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter II).

## 2. Transmittal of the copy of the translation to the designated or elected Offices.

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following designated or elected Offices requiring such translation:

None

The following designated or elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

AE, AG, AL, AM, AP, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EA, EC, EE, EG, EP, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OA, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

## 3. Reminder regarding translation into (one of) the official language(s) of the elected Office(s).

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability (Chapter II).

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned within the applicable time limit (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Authorized officer

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# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference M/44239-PCT	<b>FOR FURTHER ACTION</b>	See item 4 below
International application No. PCT/EP2005/002253	International filing date ( <i>day/month/year</i> ) 03 March 2005 (03.03.2005)	Priority date ( <i>day/month/year</i> ) 04 March 2004 (04.03.2004)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant BASF AKTIENGESELLSCHAFT		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).
2. This REPORT consists of a total of 9 sheets, including this cover sheet.  
  
In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- |                                     |              |   |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the report   |
| <input type="checkbox"/>            | Box No. II   | Priority  |
| <input checked="" type="checkbox"/> | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  |
| <input checked="" type="checkbox"/> | Box No. IV   | Lack of unity of invention  |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/>            | Box No. VI   | Certain documents cited   |
| <input type="checkbox"/>            | Box No. VII  | Certain defects in the international application  |
| <input type="checkbox"/>            | Box No. VIII | Certain observations on the international application   |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

Date of issuance of this report  
01 November 2006 (01.11.2006)

Authorized officer

**Agnes Wittmann-Regis**

e-mail: pt06@wipo.int

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

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Form PCT/IB/373 (January 2004)

# PATENT COOPERATION TREATY

TRANSLATION

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing **See form PCT/ISA/210**  
(day/month/year)

Applicant's or agent's file reference

**M/44239-PCT**

**FOR FURTHER ACTION**

See paragraph 2 below

International application No.

**PCT/EP2005/002253**

International filing date (day/month/year)

**03.03.2005**

Priority date (day/month/year)

**04.03.2004**

International Patent Classification (IPC) or both national classification and IPC

**C07D233/54 C07F7/08, C07F5/02, C07F9/09**

Applicant

**BASF AKTIENGESELLSCHAFT**

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/IEP

Authorized officer

Facsimile No.

Telephone No.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2005/002253

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language  
\_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing  
☐ table(s) related to the sequence listing

b. format of material

- ☐ in written format  
☐ in computer readable form

c. time of filing/furnishing

- ☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2005/002253

Box No. III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application

☒ claims Nos. 17-18

because:

☐ the said international application, or the said claims Nos. \_\_\_\_\_  
relate to the following subject matter which does not require an international preliminary examination (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. \_\_\_\_\_  
are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. \_\_\_\_\_ are so inadequately supported  
by the description that no meaningful opinion could be formed.

☒ no international search report has been established for said claims Nos. 17-18

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form

☐ has not been furnished

☐ does not comply with the standard

the computer readable form

☐ has not been furnished

☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.

☐ See Supplemental Box for further details.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2005/002253

Box No. IV

Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has:
- ☐ paid additional fees
  - ☒ paid additional fees under protest
  - ☐ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is
- ☐ complied with
  - ☒ not complied with for the following reasons:

The various inventions are:

Claims 1-16: Process for preparing ionic liquids whose cation contains a quaternary sp<sup>2</sup>-hybridized nitrogen atom

Claims 17-18: Ionic liquids prepared by the process according to the application and their use

For the following reasons, these inventions are not so linked as to form a single general inventive concept (PCT Rule 13.1):

The criterion of unity requires a particular technical feature which is common to all claims and makes a contribution to the state of the art. Since representatives of the compounds prepared by the process according to the application are known, as also acknowledged in the description, and a novel process for preparing them cannot confer novelty on a compound which is already known, the criterion of unity is not met, so that at least the two abovementioned inventions are present in the current application.

4. Consequently, this opinion has been established in respect of the following parts of the international application:

☒ all parts

☐ the parts relating to claims Nos. \_\_\_\_\_

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2005/002253

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1-18	YES
	Claims	NO
Inventive step (IS)	Claims 1-16	YES
	Claims 17-18	NO
Industrial applicability (IA)	Claims 1-18	YES
	Claims	NO

2. Citations and explanations:

The present application discloses a process for preparing an ionic compound (claims 1-16), the ionic compounds themselves (claim 17) and their use (claim 18).

**Invention 1 (claims 1-16)**

D1: EP-A-1 182 196 (SOLVENT INNOVATION GMBH) 27 February 2002  
(2002-02-27)

The present application discloses a process for preparing an ionic compound (claims 1-16), the ionic compounds themselves (claim 17) and their use (claim 18).

The process according to the application differs from the process disclosed in examples 2-11 of D1 in that a compound which contains a double-bonded nitrogen atom is reacted with dialkyl sulfate in such a way that both alkyl groups of the alkylating agent are employed, i.e. not a monoalkyl sulfate but a sulfate is obtained as product.

The subject matter of claims 1-16 is therefore novel within the meaning of PCT Article 33(2).

The closest prior art is D1.

The problem addressed by the present application was to provide a further process for the halide-free preparation of ionic liquids.

D1 teaches the use of at least one mole of dialkyl sulfate per mole

WRITTEN OPINION OF THE  
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Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

of amine (page 5, 55-57), and in the examples, too, the dialkyl sulfate is used in an amount which is just sufficient for the alkyl sulfate but not the sulfate to be obtained in each case (cf. page 8, 8-15).

Since D1 therefore suggests to a person skilled in the art that he should use dialkyl sulfate in such a way that both alkyl groups are used, the process of the application cannot be considered obvious.

As a consequence, an inventive step within the meaning of PCT Article 33(3) can be acknowledged for the subject matter of claims 1-16.

**Invention 2 (claims 17-18)**

D2: WO A 02/094883

D3: WO A 01/981353

The current claims 17-18 relate to an inordinately large number of possible products of which only a small number are supported by the description within the meaning of PCT Article 6 and/or can be considered to be disclosed in the patent application within the meaning of PCT Article 5.

Furthermore, the initial stages of the search yielded a very large number of documents prejudicial to novelty, and D2 and D3 are cited merely as an illustrative selection. The number of documents prejudicial to novelty is so large that it becomes impossible to identify anything in the claims as a whole for which protection might justifiably be sought (PCT Article 6).

For these reasons, it does not appear possible to carry out a meaningful search covering the full range of the claims. The search was therefore restricted to the examples disclosed in the description.

The present application discloses salts of 1-butyl-3-methylimidazolium and of 1-methyl-3-ethylimidazolium.



WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2005/002253

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

Salts of 1-butyl-3-methylimidazolium and of 1-methyl-3-ethylimidazolium are also described in D2 (D2 is, like the present application, directed at the synthesis of halide-free ionic liquids but follows a completely different approach than in the present application) and D3 but with other ions, so that the subject of claims 17 and 18 of the application is novel over D2 and D3 and the requirements of PCT Article 33(2) are consequently met.

Starting out from D2, which can be considered to be the closest prior art, the problem addressed by the second invention is to provide further salts of 1-butyl-3-methylimidazolium and of 1-methyl-3-ethylimidazolium which are free of halide and free of monoalkyl sulfate.

To be inventive within the meaning of PCT Article 33(3), a new chemical compound has to meet at least one of the following prerequisites.

- a. an unexpected structure or
- b. a unexpected effect or possible use (guidelines C-IV, 9.10), or
- c. this compound is the result of an inventive process, but only when either this process has refuted a technical prejudice or insuperable difficulties have occurred in its preparation up to now (guidelines C-IV, 9.8(d)).

Since in the present case it is obvious that none of the above prerequisites are met, an inventive step within the meaning of PCT Article 33(3) cannot be acknowledged for the subject matter of claims 17-18 of the application.

Formal objections (inventions 1 and 2):

The definitions of particular functional groups used in the claims given in the description (page 4 ff.) differ considerably from what a reader familiar with the art would understand by them; for example, the expression "alkyl" refers to a straight-chain or branched **unsubstituted** hydrocarbon radical; in contrast, the description indicates that such a radical can also be substituted.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2005/002253

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

This also applies to the "expanded" definitions of "cycloalkyl",  
"heterocycloalkyl", "aryl", "hetaryl".

Such contradictions between claims (particular mention may be made  
here of claims 5 and 7) and description constitute a violation of  
PCT Article 6.